Policy Specification, Composition, and Conformance

Abstract

Secure but cooperative systems, privacy protection, and business rules for everybody: the Working Group on "Policy specification, composition, and conformance" aims at designing policy languages and policy-driven systems that enhance user privacy, Web service usability and protection, and improve user control on the policies applied by open systems and services.

Mission

Security and privacy protection are often in conflict with system usability. Higher-quality and more competitive services can be built if we succeed in injecting some intelligence in the procedures that handle security and privacy policies. The burden of providing and gathering security-related information and certificates should be progressively moved from users to machines, by improving current interoperability techniques.

Another challenge is enhancing user control and awareness on system behaviour, be it determined by security/privacy policies, business rules, or quality-of-service rules. If common users are to specify their own rules and understand the automated decisions of systems and web services, then users must be given high-level tools - e.g. natural language parsers - to formulate policies and ask systems for explanations. Good explanation facilities may make a web service more competitive by attracting occasional users.

Through a rule-based approach, the working group aims both at giving users more control, and at reducing the cost of building and maintaining cooperative systems and services, by means of intelligent tools for generating as automatically as possible the dialogs with the users.

More information available at http://rewerse.net/i2
Description of Research

Research activities covers several complementary threads. One line concerns trust management; by this we mean both techniques based on the negotiation of electronic credentials, and trust models based on reputation. Another line of research focuses on extending policy language implementations with high-level query answering and explanation facilities, as well as the ability of executing actions (to log interesting events, activate workflows, etc.) Last but not least, a crucial research activity is devoted to the controlled natural language front-end, to be adapted and extended to handle policy expressions and nonmonotonic reasoning.

Tools & Technologies

The Working Group is extending and adapting the rule-based trust management system PeerTrust (http://www.learninglab.de/english/projects/peertrust.html) and the Attempto Controlled English system (ACE) for natural language specification and query answering (http://www.ifi.unizh.ch/attempto/).

The underlying technologies involve standard Web technology - including Java - and lightweight Prolog technology, sometimes compiled directly on Java classes and bytecode. The Group’s goals comprise compliance with the major Web standards for security, privacy and rules (e.g., XACML, P3P, and RuleML.)

Glossary

The word “policy” is used here in the broad sense of high-level specifications of a complex system behaviour, regulating in particular the interactions between different system parts. Thus, our understanding of the word “policy” encompasses security and privacy policies, business rules and quality-of-service specifications as special cases (to name a few).

“Trust management” deals with the problem of verifying properties of users, organizations, electronic resources and systems in a reliable way, even in the absence of a single centralized control. Flexibility is a key issue: users-system and system-system interactions are often occasional and hard to predict in our reference scenarios. Trust management involves both credential-based property verification and reputation-based trust assignment issues.

The expression "Controlled natural language" denotes unambiguous fragments of natural language, well suited to write executable specifications. Controlled natural language can be used by people with no particular training in computer programming, after learning a small number of simple rules, that explain which sentences are accepted and how they are understood by the system.

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Impressum

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